

October 22, 1993
SP307:102293:02

Mr. Randy T. Ogg
Program Manager, Environmental Restoration
EG&G Rocky Flats
P.O. Box 464, Building 080
Golden, Colorado 80402-0464

SUBJECT: Proposed Closure Performance Criteria

Dear Mr. Ogg:

Enclosed is a draft of the proposed OU 4 Solar Evaporation Pond closure performance criteria for your review and comment. The regulations were reviewed to establish the closure requirements. The criteria are proposed based on guidance documents and standard engineering practices.

If you have any questions, please do not hesitate calling me at 831-8100, extension 207.

Sincerely,

ENGINEERING-SCIENCE, INC.



Philip A. Nixon
Project Manager: Solar Pond IM/IRA

cc:	K. Ruger	B. Cropper
	M. Austin	T. Evans
	R. Wilkinson	L. Benson
	T. Kuykendall	A. Conklin
	R. Stegen	A. Fricke
	H. Heidkamp	S. Stenseng
	C. Montes	D. Myers
	K. Cutter	

R9-6-22.WPF



ADMIN RECCR!
1101-A-000181

**OU 4 SOLAR EVAPORATION PONDS
PROPOSED CLOSURE PERFORMANCE CRITERIA**

As required by the IAG, the SEPs will be closed pursuant to the RCRA interim status requirements for the closure of surface impoundments under the State of Colorado Hazardous Waste Management Program. The purpose of this document is to propose performance criteria that will be followed to comply with the State of Colorado program requirements. The criteria are being presented to CDH, EPA, and DOE to obtain agreement for the basis by which the potential IM/IRA closure/remediation alternatives will be evaluated against. The selected alternative will be designed to meet the performance criteria. This document is divided into the following components: Identification of Regulatory Requirements, Proposed Performance Criteria, and Conclusions.

IDENTIFICATION OF REGULATORY REQUIREMENTS

As stated in 6 CCR 1007-6, 265.111, the closure performance standards specify that the owner or operator must close his facility in a manner that:

- a) Minimizes the need for further maintenance
- b) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters, or to the atmosphere
- c) Complies with the closure requirements ... of Section 265.228....

Section 265.228(a) requires that the surface impoundments be closed by one of two methods:

- 1) Remove or decontaminate all waste residues, contaminated containment system components (liners etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless Section 261.3(d) applies
- 2) Close the impoundment and provide post-closure care for a landfill under Subpart G and Section 265.310.

Closing the SEPs as a landfill would have the following requirements with respect to Section 265.228(a)(2) and 265.310(a):

- i) Eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and waste residues
- ii) Stabilize remaining wastes to a bearing capacity

Attachment 1
Page 2/1084

sufficient to support the final cover

iii) Cover the surface impoundment with a final cover designed and constructed to: (A) provide long-term minimization of the migration of liquids through the closed impoundment, (B) function with minimum maintenance, (C) promote drainage and minimize erosion or abrasion of the cover, (D) accommodate settling and subsidence so that the cover's integrity is maintained, (E) and have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present

PROPOSED PERFORMANCE CRITERIA

The following performance criteria are proposed for the selection and design of a remedial/closure alternative to comply with the regulatory requirements presented above.

Regulatory requirement 6 CCR 1007-6, 265.111(a)

Proposed Criteria: The recommended alternative will be designed to incorporate components which will minimize maintenance requirements. For alternatives involving an engineered cover, the slope and dimension of an engineered cover will be designed so that the negative impacts from excessive precipitation infiltration (too flat) and the negative results of erosion (too steep) are balanced. The design of any waste treatment facility required to implement the selected closure/remediation alternative will be in accordance with standard engineering practices such that only minimal maintenance will be required for the facility during its operational lifetime.

Regulatory Requirement 6 CCR 1007-6, 265.111(b)

Proposed Criteria: The recommended alternative will be designed such that mitigation of potential contamination remaining in the subsurface meets the Preliminary Remediation Goals (PRGs) established for the Contaminants of Concern (COC). As specified by CDH, the PRGs for hazardous constituents will not exceed a cumulative risk of 1.0×10^{-6} for carcinogens, and a hazard index of one for hazardous non-carcinogens. The carcinogenic risk from radionuclides will not exceed 1.0×10^{-6} for each specific radionuclide. The cumulative carcinogenic risk from radionuclides will not exceed 1.0×10^{-4} . This is consistent with the EPA CERCLA regulation Section 430(e)(2)(i)(A)(2).

Regulatory Requirement 6 CCR 1007-6, 265.228(a)

Proposed Criteria: The SEPs are required to be will be closed by either: (1) removing or decontaminating all waste and contaminated media, or (2) leaving the liners and contaminated media in place with subsequent closure as a landfill. If the SEPs are closed by removing or decontaminating the waste and contaminated media, then

Attachment 1
Page 2084

only the requirements of 265.111(a) and (b) will need to be met. If the SEPs are to be closed as a landfill, then the additional closure standards identified in Sections 265.228(a)(2) and 265.310(a) will apply. The performance criteria, which will be used for the development of alternatives involving an engineered cover, to ensure compliance with these additional closure standards are as follows:

Regulatory Requirement 6 CCR 1007-6, 265.228(a)(i)

Proposed Criteria: The waste liquids, sludge, and residues will be removed prior to the final closure.

Regulatory Requirement 6 CCR 1007-6, 265.228(a)(ii)

Proposed Criteria: Any waste remaining in the SEPs (liners) will be treated, if necessary, to structurally support the backfill and cover material such that the subsidence will be uniform and the integrity of any remaining dikes/berms will not be breached.

Regulatory Requirement 6 CCR 1007-6, 265.228(a)(iii)

Proposed Criteria: The design of the engineered cover will meet, as a minimum, the following performance criteria:

- A) Long term minimization of liquid migration through the cover will be achieved by maintaining a top slope of between 3 and 5 percent after subsidence (EPA, 1989).
- B) Minimization of maintenance will be achieved by the use of herbaceous species such as grasses that do not require frequent mowing
- C) Drainage will be promoted and erosion will be minimized through the use of side slopes ranging between 5H:1V to 10H:1V, but slopes may be steeper where space constraints dictate. Where steeper side slopes are used, additional erosion control and slope stability measures will be analyzed. The maximum rate of erosion will be limited to 2 tons/acre/year (EPA, 1989). Cover soils will have a minimum thickness of 24 inches (EPA, 1989). Stormwater runoff management will be designed for a 25-year, 6-hour storm event (RFP, 1985). Minimum culvert size will be 15 inches in diameter (RFP, 1985). Surface runoff will be discharged to a point approved for clean runoff. No surface water flows will be discharged to areas requiring treatment of surface water runoff.
- D) The factor of safety against cover soil sliding will be greater than 1.2. The design frost depth will be 36-inches (M. Austin, Personal communication).

Attachment 1
Page 3084

E) A hydraulic barrier will be designed with a minimum hydraulic conductivity equal to the average of the subsurface soil hydraulic conductivity.

CONCLUSION

This analysis presents the regulatory requirements for the closure of surface impoundments under the State of Colorado Hazardous Waste Management Program, and proposes performance criteria based on applicable guidance documents and standard engineering practice. A waiver or variance will be requested if the selected alternative can not be designed to meet the above mentioned performance criteria.

REFERENCES

Rocky Flats Plant Design Criteria, "Engineering and Architectural Services" Volume 1, Rockwell International, North American Space Operations, December 1985.

EPA/530-SW-89-047, "Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments", July 1989.

Personal Communication with Mr. Mark Austin (EG&G) on October 20, 1993.

attachment
Page 4084